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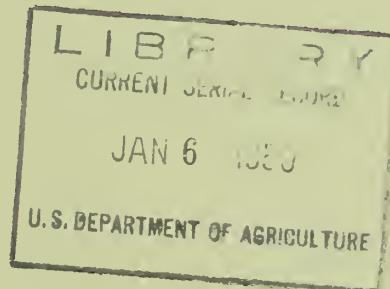
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# FEDERAL-STATE COOPERATIVE SNOW SURVEYS and IRRIGATION WATER FORECASTS

for  
**ARIZONA**  
February 15, 1949



by  
Division of Irrigation, Soil Conservation Service  
United States Department of Agriculture

Data included in this report were obtained by the agency named above in cooperation with the Federal, State, and local organizations listed on the last page of this report.



FEDERAL-STATE COOPERATIVE  
SNOW SURVEYS AND IRRIGATION WATER FORECASTS  
FOR  
ARIZONA

Report Prepared  
by  
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Division of Irrigation  
Soil Conservation Service  
Reno, Nevada

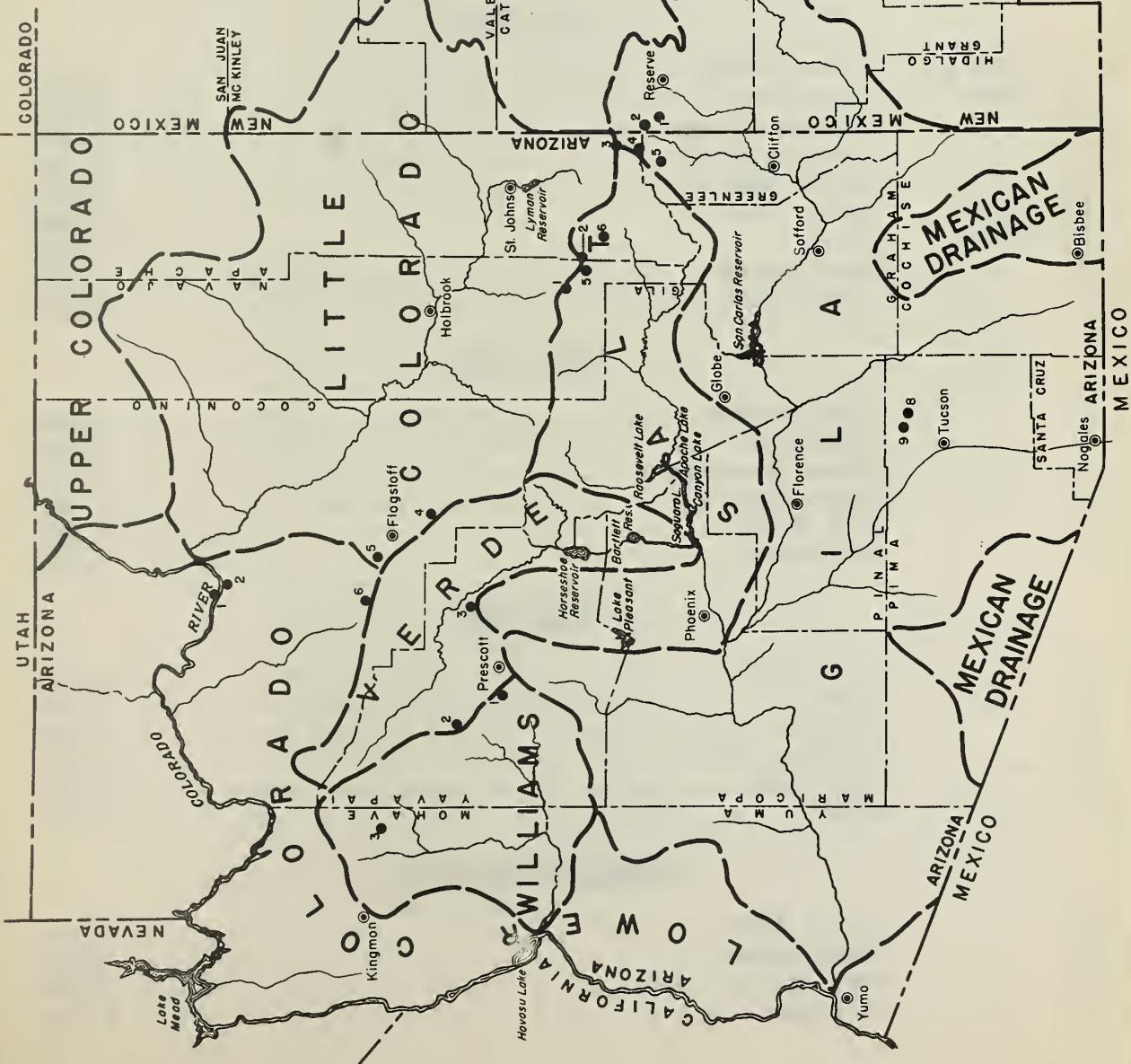


# ARIZONA COOPERATIVE SNOW SURVEYS

SNOW COURSES AND DRAINAGE BASINS

October 1947

32 0 32 64  
SCALE IN MILES



INDEX TO SNOW COURSES

NUMBER	NAME	ELEVATION
<u>LITTLE COLORADO RIVER</u>		
1.	Forest Dale . . . . .	6,000
2.	McNary . . . . .	7,200
3.	Nutrioso . . . . .	8,500
4.	Mormon Lake . . . . .	7,350
5.	Fort Valley . . . . .	7,350
<u>WILLIAMS RIVER</u>		
1.	Iron Springs . . . . .	6,200
2.	Camp Wood . . . . .	5,700
3.	Willow Ranch . . . . .	5,000
<u>GILA RIVER</u>		
1. (N.M.)	Frisco Divide . . . . .	8,000
2. (N.M.)	State Line . . . . .	8,000
3.	Nutrioso . . . . .	8,500
4.	Coronado Trail . . . . .	8,000
5.	Beaver Head . . . . .	8,000
6. (N.M.)	Taylor Creek . . . . .	7,850
7. (N.M.)	Irman . . . . .	7,800
8.	Rose Canyon . . . . .	7,300
9.	Bear Wallow . . . . .	8,100
<u>VERDE RIVER</u>		
1.	Iron Springs . . . . .	6,200
2.	Camp Wood . . . . .	5,700
3.	Mingus Mountain . . . . .	7,100
4.	Mormon Lake . . . . .	7,350
5.	Fort Valley . . . . .	7,350
6.	Chalender . . . . .	7,100
<u>SALT RIVER</u>		
1.	Forest Dale . . . . .	6,000
2.	McNary . . . . .	7,200
3.	Nutrioso . . . . .	8,500
4.	Coronado Trail . . . . .	8,000
5.	Milk Ranch . . . . .	7,000
6.	McKay . . . . .	8,250
<u>LOWER COLORADO RIVER</u>		
1.	Bright Angel . . . . .	8,400
2.	Grand Canyon . . . . .	7,500
5.	Fort Valley . . . . .	7,350
6.	Chalender . . . . .	7,100

## WATER SUPPLY OUTLOOK

Arizona

February 15, 1949

\*  
\* February 15, 1949 snow surveys indicate a \*  
\* potential flood hazard on practically all \*  
\* mountain streams. Heavy snow storms com- \*  
\* bined with sub-normal temperatures have \*  
\* produced record breaking snow packs. January\*  
\* run-off was extremely high. Although re- \*  
\* servoir storage is much improved, the past \*  
\* drouth was so severe that continued abnorm- \*  
\* ally heavy snowfall is necessary to over- \*  
\* come the water shortage which has been acc- \*  
\* umulating during the past six years. \*

\* \*

Precipitation At the higher elevations of the State January precipitation was abnormally heavy. In general, Little Colorado River Watershed received approximately 200 percent of normal precipitation while that on the head waters of Williams River was about 300 percent. The extremely valuable water producing areas contributing to Verde, Salt, and Gila Rivers received from 350 to 450 percent of normal precipitation during the month. Soil moisture conditions continue very good.

Snow Cover Snow stored water on all snow courses in Arizona was greater on February 15, 1949, than ever before measured during the past ten years of record. Gila River surveys show water stored in snow to be better than three times normal while Salt and Little Colorado are about four times normal. This situation may be attributed to both the abnormally high snowfall and the subnormal temperatures which occurred prior to February 15. A sudden thaw may cause local floods at the higher elevations while a general rain on the existing snow pack may produce flood conditions along the main streams above storage reservoirs.

## THE INFLUENCE OF THE ENVIRONMENT ON THE GROWTH AND DEVELOPMENT OF THE COTTON PLANT

By J. R. GALT, JR., and W. H. COOPER, JR.  
Department of Botany, University of Georgia, Athens, Georgia

(Received January 15, 1951; revised April 15, 1951)

*Abstract.* The growth and development of cotton plants were studied under field conditions at three locations in Georgia during 1949 and 1950. The data were collected from 100 plants per location per year.

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Runoff January runoff was extremely high in many areas of Arizona. Little Colorado River discharged over 2000 percent of median for the month, while the flow of Gila River near Solomonville was more than 1000 percent. Verde and Salt Rivers, were not quite so high, with about 300 and 700 percent of median measured at key gaging stations. Abnormally cold weather at the higher elevations during the early part of February retarded runoff during this period.

Reservoir Storage Reservoir storage continued to improve throughout the Gila River and Central Arizona Systems. San Carlos Reservoir with approximately 162,000 acre feet stored on February 15, contains its greatest amount since 1944. Although this is a welcome improvement much more will be needed to satisfy future requirements for irrigation water. Lake Pleasant contained about 18,000 acre feet which is equivalent to the past 10 year average for this date. Storage on Verde River was about 94,000 acre feet. This is twice the average for the past eight years. Combined storage on Salt River amounted to 330,000 acre feet, which is about 100,000 acre feet more than were stored last year, but only about 50 percent of the 1938-47 average. Lake Mead contained 18,563,000 acre feet while last year on this date there were 19,448,000 acre feet in storage.

and the other two were the same as the first. The last was a very  
large one, and I think it must have been about 100 ft. long. It  
was made of a large number of logs, and was built up in a  
series of steps, so that the water could pass over it. The logs  
were all cut from large trees, and were very thick. The  
water was very clear, and I could see the bottom of the river  
quite easily. The river was very wide, and the water was  
moving very slowly. The banks of the river were very  
steep, and the water was very deep. The water was  
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TABLE I

## ARIZONA SNOW SURVEYS FEBRUARY 15, 1949

DRAINAGE BASIN and SNOW COURSE	Number	Sec.	Twp.	Rge.	Elev.	Date of Survey	Snow Depth (Inches)	SNOW COVER MEASUREMENT		
								Water Content (Inches)	Same Approx. Date	Past Record
<b>LITTLE COLORADO RIVER</b>										
Forest Dale	1	2	9N	21E	6000	2/14	20.8	6.0	1.7	0.7
McMary	2	14	8N	23E	7200	2/14	28.0	8.8	2.8	2.6
Nutrioso	3	23	6N	30E	8500	2/15	33.5	9.1	3.2	2.3
Mormon Lake	4	13	18N	8E	7350	2/15	72.5	22.1	6.8	4.3
Fort Valley	5	22	22N	6E	7350	2/15	41.5	11.6	1.0	0.5
<b>WILLIAMS RIVER</b>										
Iron Springs	1	22	14N	3W	6200	2/12	33.8	10.9	0.5	0.2
Camp Wood	2	3	16N	6W	5700	2/15	29.0	8.3	0.5	0.2
Willow Ranch	3	16	21N	11W	5000	2/16	14.5	4.3	0	0
<b>GILA RIVER</b>										
Frisco Divide	1	31	6S	20W	8000	2/15	24.8	6.3	3.3	2.0
State Line	2	6	6S	21W	8000	2/15	29.8	8.1	3.2	3.0
Nutrioso	3	23	6N	30E	8500	2/15	33.5	9.1	3.2	2.3
Coronado Trail	4	26	5N	30E	8000	2/15	38.6	12.4	4.0	3.6
Beaver Head	5	13	4N	30E	8000	2/15	33.7	10.1	No Survey	3.2
Taylor Creek	6	20	10S	10W	7850	No Report	"	1.8	0	0.5
Imman	6	11S	10W	7800	"	"	"	1.3	0	0.9
Rose Canyon	8	15	12S	16E	7300	2/15	20.4	4.2	1.5	New Course
Bear Wallow	9	6	12S	16E	8100	2/15	32.3	7.9	2.2	"

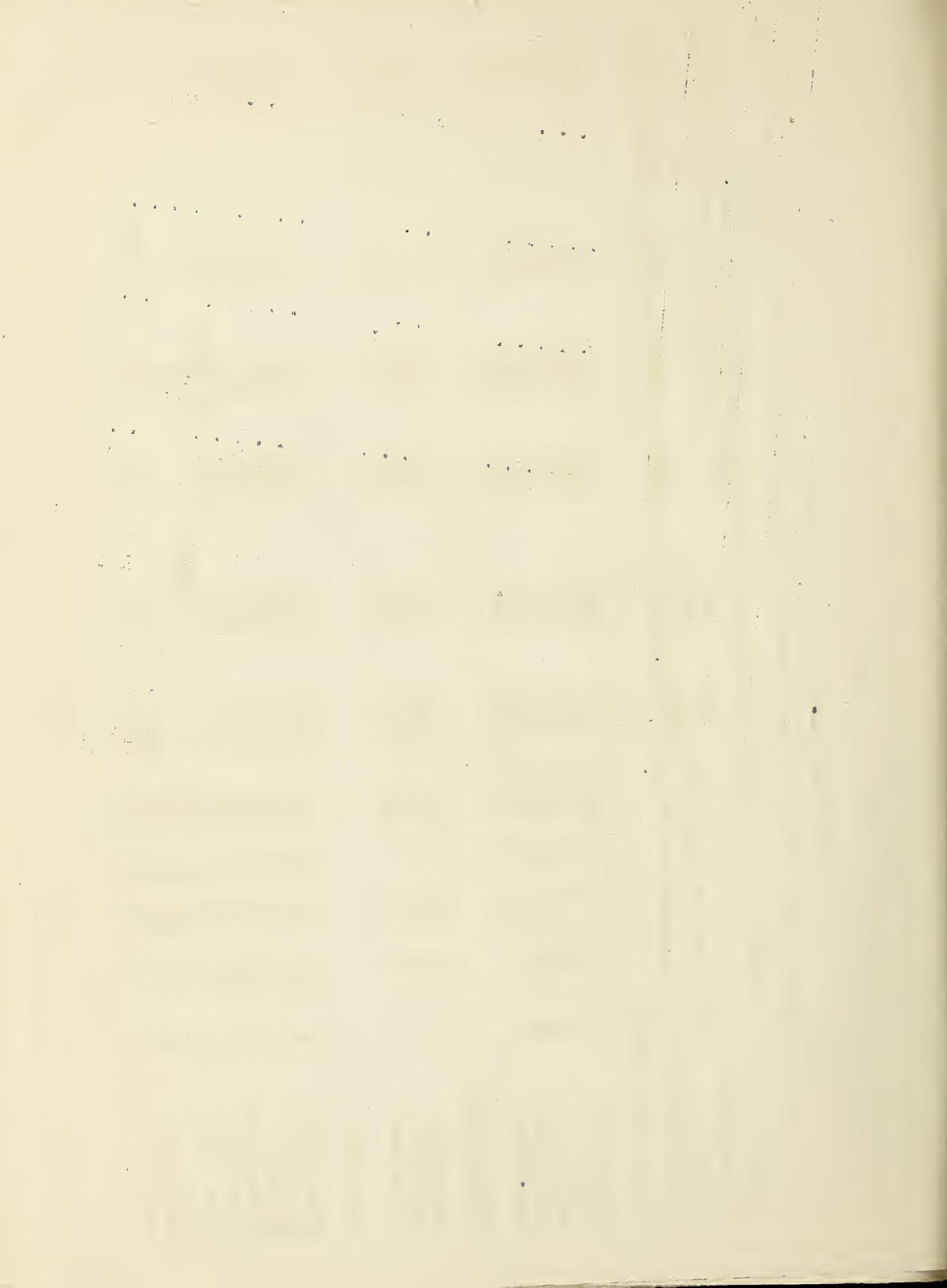


TABLE I

## ARIZONA SNOW SURVEYS FEBRUARY 15, 1949

DRAINAGE BASIN and SNOW COURSE	LOCATION						SNOW COVER MEASUREMENTS					
	Number	Sec.	Twp.	Rge.	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)		Past Record		
								Same	Approx.	Date	Years of Content	Av. Water Content (Inches)
<b>VIRIDE RIVER</b>												
Iron Springs	1	22	14N	3W	6200	2/12	33.8	10.9	0.5	0	3	0.2
Camp Wood	2	3	16N	6W	5700	2/15	29.0	8.3	0.5	0	3	0.2
Mingus Mountain	3	3	15N	2E	7100	2/14	29.9	10.8	0.5	0	2	0.3
Mormon Lake	4	13	18N	8E	7350	2/15	72.5	22.1	6.8	1.7	2	4.3
Fort Valley	5	22	22N	6E	7350	2/15	41.5	11.5	1.0	0	2	0.5
Chalender	6	27	22N	3E	7100	2/15	38.1	10.9	3.4	0	2	1.9
<b>SALT RIVER</b>												
Forest Dale	1	2	9N	21E	6000	2/14	20.8	5.0	1.7	0	9	0.7
McNary	2	14	8N	23E	7200	2/14	28.0	7.8	2.8	0.4	9	2.6
Nutrioso	3	23	6N	30E	8500	2/15	33.5	9.1	3.2	0.4	9	2.3
Coronado Trail	4	26	5N	30E	8000	2/15	38.6	12.4	4.0	0.2	9	3.6
Milk Ranch	5	28	8N	23E	7000	2/14	21.9	5.1	1.6	0	8	1.2
<b>LOWER COLORADO RIVER</b>												
Bright Angel	1	34	33N	3E	8400	2/15	57.9	17.9	6.6	New Course	"	
Grand Canyon	2	21	30N	1E	7500	2/14	33.1	8.9	2.2	"	0	
Fort Valley	5	22	22N	6E	7350	2/15	41.5	11.6	1.0	0	2	0.5
Chalender	6	27	22N	3E	7100	2/15	38.1	10.9	3.4	0.3	2	1.9

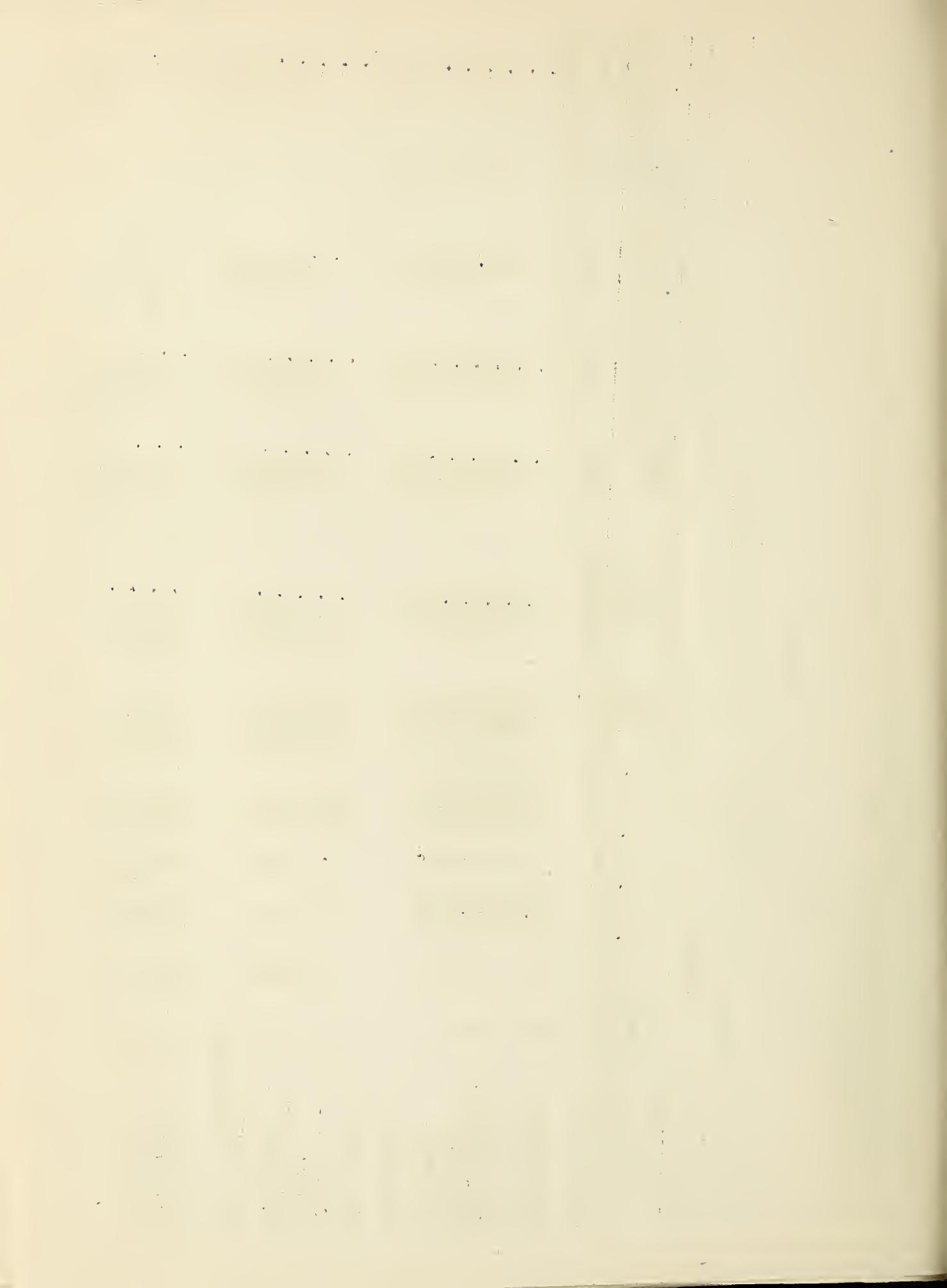


TABLE 2  
STATUS OF RESERVOIR STORAGE, February 15, 1949

BASIN and STREAM	RESERVOIR	USABLE CAPACITY (Thous. A.F.)	THOUSANDS ACRE FEET IN STORAGE About Feb. 15					10-Yr. Avg. 1938-1947
			1949	1948	1947	1946	1946	
Aqua Fria	Lake Pleasant	179	18	1	3	4	4	18
Colorado	Lake Havasu	688	564	583	629	605	531 <sup>a</sup>	
Colorado	Lake Mead	27,935	18,563	19,448	18,561	19,086	19,831 <sup>a</sup>	
Gila	San Carlos	1,200	162	1	19	28	223	
Salt	Salt River <sup>c</sup>	1,771	330	231	425	725	753	
Verde	Bartlett	179	93	3	34	1	53 <sup>b</sup>	
Verde	Horseshoe	67	1	11	16	16	New	

a - Average for years 1939 - 1947

b - Average for years 1941 - 1947

c - Includes Roosevelt, Apache, Saguaro, and Canyon Lakes



LIST OF SNOW SURVEYORS

<u>SNOW COURSE</u>	<u>SURVEYOR</u>
Forest Dale . . . . .	W. Fair & M. Woodward
McNary . . . . .	W. Fair & M. Woodward
Nutrioso . . . . .	R. L. Diggs
Mormon Lake . . . . .	M. F. Greaves
Fort Valley . . . . .	A. P. Loska
Iron Springs . . . . .	Ernest Saxby
Camp Wood . . . . .	Mrs. C. C. Merritt
Willow Ranch . . . . .	Tiny Miller
Frisco Divide . . . . .	Dean M. Earl
Coronado Trail. . . . .	R. L. Diggs
Beaver Head . . . . .	Jes Burke
Mingus Mountain . . . . .	Harold Linn
Chalender . . . . .	Schroeder, Cravens, & Callahan
Milk Ranch . . . . .	W. Fair & M. Woodward
State Line . . . . .	Dean M. Earl
Rose Canyon . . . . .	Wm. Hughes
Bear Wallow . . . . .	Wm. Hughes
Bright Angel . . . . .	S. Brown & J. Brown
Grand Canyon . . . . .	F. Brueck & W. Kennedy



The following organizations cooperate in the Arizona snow survey work:

STATE

Nevada Agricultural Experiment Station  
Reno, Nevada

FEDERAL

Department of Agriculture  
Forest Service  
Apache Forest  
Coconino Forest  
Coronado Forest  
Gila Forest  
Kaibab Forest  
Prescott Forest  
Southwestern Forest and Range Expt.  
Station, Fort Valley, Arizona  
Soil Conservation Service  
Division of Irrigation

Department of Commerce  
Weather Bureau  
Arizona Section

Department of Interior  
Bureau of Reclamation  
Region III  
Geological Survey  
Arizona District  
Indian Service  
Fort Apache Reservation  
National Park Service  
Grand Canyon National Park

Gila Water Commissioner  
Safford, Arizona

IRRIGATION PROJECTS

Salt River Valley Water Users Association  
Phoenix, Arizona

San Carlos Irrigation and Drainage District  
Coolidge, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

